

M.B.A. DEGREE EXAMINATION, JANUARY 2010
First Semester
BA 9201 – STATISTICS FOR MANAGEMENT
(Regulations 2009)

Time: Three hours

Maximum: 100 Marks

Statistical Table Book need to be provided

Answer ALL Questions

PART A – (10 × 2 = 20 Marks)

1. What are the common types of variables used in statistics?
2. Name a few descriptive measures of data.
3. What is the central limit theorem?
4. What are elements and variables in a data set?
5. What are parametric tests?
6. If a class of students is examined and the researcher wants to test the difference in performance between boys and girls, what test will you use?
7. What is a non parametric test?
8. Name four non parametric tests.
9. How will you test the accuracy of a regression equation?
10. Why are index numbers used?

PART B – (5 × 16 = 80 Marks)

11. (a) The following data shows the yearly income distribution of a sample of

200 employees at MNM, Inc.

Yearly Income Number

(In \$1,000s) of Employees

20 - 24 2

25 - 29 48

30 - 34 60

35 - 39 80

40 - 44 10

(i) What percentage of employees has yearly income of \$35,000 or more?

(ii) Is the figure (percentage) that you computed in (i) an example of

statistical inference? If no, what kind of statistics does it represent?

(iii) Based on this sample, the president of the company said that “45% of all our employees’ yearly income are \$35,000 or more”.

The president’s statement represents what kind of statistics?

(iv) With the statement made in (iii) can we assure that more than 45% of all employees’ yearly income are at least \$35,000? Explain.

(v) What percentage of employees of the sample has yearly income of \$29,000 or less?

(vi) How many variables are presented in the above data set?

(vii) The above data set represents the results of how many observations?

Or

(b) An experiment consists of throwing two six-sided dice and observing the

number of spots on the upper faces. Determine the probability that

(i) the sum of the spots is 3

(ii) each die shows four or more spots

(iii) the sum of the spots is not 3

(iv) neither a one nor a six appear on each die

(v) a pair of sixes appear

(vi) the sum of the spots is 7.

12. (a) The life expectancy in the United States is 75 with a standard deviation

of 7 years. A random sample of 49 individuals is selected.

(i) What is the probability that the sample mean will be larger than 77 years?

(ii) What is the probability that the sample mean will be less than 72.7 years?

(iii) What is the probability that the sample mean will be between 73.5 and 76 years?

(iv) What is the probability that the sample mean will be between 72 and 74 years?

(v) What is the probability that the sample mean will be larger than 73.46 years?

Or

(b) A random sample of 121 checking accounts at a bank showed an average daily balance of \$280. The standard deviation of the population is known to be \$66.

(i) Is it necessary to know anything about the shape of the distribution of the account balances in order to make an interval estimate of the mean of all the account balances? Explain.

(ii) Find the standard error of the mean.

(iii) Give a point estimate of the population mean.

(iv) Construct a 80% confidence interval estimates for the mean.

(v) Construct a 95% confidence interval for the mean.

13. (a) The Dean of Students at UTC has said that the average grade of UTC

students is higher than that of the students at GSU. Random samples of grades from the two schools are selected, and the results are shown below.

UTC GSU

Sample Size 14 12

Sample Mean 2.85 2.61

Sample Standard Deviation 0.40 0.35

Sample Mode 2.5 3.0

(i) Give the hypotheses.

(ii) Compute the test statistic.

(iii) At a 0.1 level of significance, test the Dean of Students' statement.

Or

(b) Random samples of employees from three different departments of NMC

Corporation showed the following yearly income (in \$ 1,000).

Department A Department B Department C

40 46 46

37 41 40

43 43 41

41 33 48

35 41 39

38 42 44

At $05 . = \alpha$, test to determine if there is a significant difference among the

average income of the employees from the three departments. Use both the critical and p- value approaches.

14. (a) The sales records of two branches of a department store over the last

12 months are shown below. (Sales figures are in thousands of dollars).

We want to use the Mann-Whitney-Willcoxon test to determine if there is a significant difference in the sales of the two branches.

Month Branch A Branch B

1 257 210

2 280 230

3 200 250

4 250 260

5 284 275

6 295 300

7 297 320

8 265 290

9 330 310

10 350 325

Month Branch A Branch B

11 340 329

12 272 335

(i) Compute the sum of the ranks (T) for branch A.

(ii) Compute the mean $T \mu$.

(iii) Compute $T \sigma$.

(iv) Use $\alpha = 0.05$ and test to determine if there is a significant difference in

the populations of the sales of the two branches.

Or

(b) Two faculty members ranked 12 candidates for scholarships. Calculate the Spearman rank-correlation coefficient and test it for significance. Use 0.02 level of significance.

Rank by Rank by

Candidate Professor A Professor B

1 6 5

2 10 11

3 2 6

4 1 3

5 5 4

6 11 12

7 4 2

8 3 1

9 7 7

10 12 10

11 9 8

12 8 9

15. (a) The following data represent the number of flash drives sold per day at a

local computer shop and their prices.

Price (x) Units Sold (y)

\$34 3

36 4

32 6

35 5

30 9

38 2

40 1

(i) Develop a least-squares regression line and explain what the slope of the line indicates.

(ii) Compute the coefficient of determination and comment on the strength of relationship between x and y.

(iii) Compute the sample correlation coefficient between the price and the number of flash drives sold. Use $0.1 = \alpha$ to test the relationship

between x and y.

Or

(b) The table below gives the prices of four items —A, B, C and D— sold at a store in 2000 and 2006

	Price	Price	Quantity	Quantity
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Item	2000	2006	2000	2006
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A	\$ 40	\$ 10	1,000	800
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B	55	25	1,900	5,000
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C	95	40	600	3,000
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D	250	90	50	200
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(i) Using 2000 as the base year, calculate the price relative index for the four items.

(ii) Calculate an unweighted aggregate price index for these items.

(iii) Find the Laspeyres weighted aggregate index for these items.

(iv) Find the Passche index for these items.

(v) Construct a weighted aggregate quantity index using 2000 as the base year and price as the weight.